

Practice: 360 - Waste Facility Closure**Scenario: #1 - Demolition of Concrete Waste Storage Structure****Scenario Description:**

This practice scenario includes the demolition of a concrete waste storage structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.

Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing concrete waste storage structure is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a concrete waste storage structure, with top dimensions of 60 ft x 60 ft with 10 ft vertical walls. The walls are 8 inches thick, the concrete floor is 5 inches thick and the footing for the wall is 12 inches wide by 24 inches deep. The total structural storage volume equals 36,000 cubic feet. The total volume of concrete to be demolished is 3,580 cubic feet $([2 \times (60 \text{ ft} + 60 \text{ ft}) \times 8 \text{ in} / 12 \text{ in/ft}] + [60 \text{ ft} \times 60 \text{ ft} \times 5 \text{ in} / 12 \text{ in/ft}] + [2 \times (60 \text{ ft} + 60 \text{ ft}) \times 12 \text{ in} / 12 \text{ in/ft} \times 24 \text{ in} / 12 \text{ in/ft}])$. The volume of waste to be removed approximately equals 50% of the structural volume $(50\% \times 36,000 = 18,000 \text{ CF})$. The volume of earthwork (earthfill and/or excavation, final grading) required is approximately 50% of the structural volume. The concrete will be demolished and hauled off-site for recycling or disposal. Structural removal, as necessary, may include the sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Demolition of a concrete waste storage structure includes agitating, removing, and spreading the waste remaining in the structure. All waste material shall be land applied in accordance with Nutrient Management (590). Excavated areas will be filled in. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Demolition of the concrete waste structure will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Scenario Feature Measure: Cubic Feet of concrete to be demolished

Scenario Unit: Cubic Foot

Scenario Typical Size: 3,580

Scenario Cost: \$9,212.78

Scenario Cost/Unit: \$2.57

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Demolition, concrete	1498	Demolition and disposal of reinforced concrete structures including slabs and walls. Includes labor and equipment.	Cubic Yard	\$14.73	133	\$1,959.09
Manure, compost, injection	956	Loading, hauling and injecting manure/compost by ground equipment. Includes equipment, power unit and labor costs.	Gallon	\$0.01	134640	\$1,346.40
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.53	667	\$2,354.51
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$114.28	10	\$1,142.80
Hauling, bulk, highway truck	1615	Hauling of bulk earthfill, rockfill, waste or debris. One-way travel distance using fully loaded highway dump trucks (typically 16 CY or 20 TN capacity). Includes equipment and labor for truck only. Does not include cost for loading truck.	Cubic Yard Mile	\$0.33	1330	\$438.90
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators ≥ 50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers $\geq 12"$, Dump Trucks, Ag Equipment ≥ 150 HP, Scrapers, Water Wagons.	Hour	\$25.37	10	\$253.70
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	10	\$190.90

Mobilization

Mobilization

Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	4	\$1,033.28
Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$493.20	1	\$493.20

Practice: 360 - Waste Facility Closure**Scenario: #2 - Liquid Waste Impoundment Closure with 0% Liquids and 100% Solids****Scenario Description:**

This practice scenario includes the decommissioning of an earthen liquid waste impoundment (embankment or excavated type) where the estimated volume of waste to be removed is approximately 0% liquid/slurry waste and 100% sludge/solid waste of the structural storage capacity of the structure. The purpose of the practice is to address resource concerns related to water quality degradation due to excess nutrient and pathogens in ground and/or surface waters and air quality impacts from greenhouse gases, particulate matter and associated precursors, and objectionable odors.

Associated practices: Nutrient Management (590), Critical Area Planting (342)

Before Situation:

An existing lagoon or waste storage pond is no longer functioning correctly or is not being used for its intended purpose. It poses a safety hazard for humans and livestock and is a threat to environmental sustainability by the potential for impacts to water and air quality.

After Situation:

This scenario assumes a waste storage pond, with top dimensions of 110 ft x 110 ft, 8 ft total depth with 2:1 side slopes. The total structural storage volume equals 63,851 cubic feet. The volume of liquid waste to be pumped approximately equals 0% of the structural volume. The volume of solid waste to be removed approximately equals 100% of the structural volume (63,851 CF). The volume of earthwork (earthfill and excavation) required to breach the embankment and/or fill in the impoundment and perform final grading of the site is approximately 50% of the structural volume. The volume of earthwork will include 60% as excavation and 40% as compacted earthfill. Structural removal, as necessary, may include the removal and disposal of the synthetic liner, sealing or removal and disposal of waste transfer components and other appurtenances associated with closure of the facility. Decommissioning of a liquid waste storage impoundment includes agitating, removing, and spreading liquid/slurry waste material, removing solid/sludge waste remaining in the bottom. All waste material shall be land applied in accordance with Nutrient Management (590). If present, the synthetic liner will be removed and properly disposed of. All inflow devices and associated appurtenances will be removed and properly disposed of. The embankment will be breached and the excavation filled in with the embankment material or hauled in earthfill. The disturbed areas shall be vegetated in accordance with Critical Area Planting (342). Closure of the waste impoundment will address water quality degradation, air quality impacts and safety hazards by removing and properly utilizing the waste from the impoundment. The site will also become available for another use.

Scenario Feature Measure: Cubic feet of structural storage

Scenario Unit: Cubic Foot

Scenario Typical Size: 63,851

Scenario Cost: \$24,075.20

Scenario Cost/Unit: \$0.38

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
Equipment/Installation						
Excavation, Common Earth, side cast, small equipment	48	Bulk excavation and side casting of common earth with hydraulic excavator with less than 1 CY capacity. Includes equipment and labor.	Cubic yard	\$1.91	709	\$1,354.19
Earthfill, Roller Compacted	49	Earthfill, roller or machine compacted, includes equipment and labor	Cubic yard	\$3.53	473	\$1,669.69
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	\$114.28	12	\$1,371.36
Spreading, manure sludge	1633	Loading, hauling and spreading manure solids/sludge by ground equipment on nearby fields. Includes equipment, power unit and labor costs.	Cubic Foot	\$0.28	63851	\$17,878.28
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	\$25.37	12	\$304.44
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.09	12	\$229.08

Mobilization

Mobilization

Mobilization, large equipment	1140	Equipment >150HP or typical weights greater than 30,000 pounds or loads requiring over width or over length permits.	Each	\$493.20	1	\$493.20
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$258.32	3	\$774.96